RFQ-RT-04-00356
Statement of Work for Student Services Contract
Neurotoxicology Division - Neurophysiological Toxicology Branch
Research Triangle Park, NC

1. Project Description

The Neurotoxicology Division (NTD), of the National Health and Environmental Effects Research Laboratory, is the focal point for planning, conducting, coordinating, supporting and evaluating a program aimed at studying the effects of physical and/or chemical agents on the nervous system. The overall objective of the NTD is to provide the scientific basis and technological means to enable the prediction of whether or not an environmental agent will produce neurotoxicity in humans. A major research goal is to minimize the uncertainty of such predictions.

Research performed by the Neurophysiological Toxicology Branch is aimed at attaining an understanding of how neuro-physiological processes are altered by exposure to neurotoxic agents. Neurophysiological research is conducted across a range of levels of analysis including investigations of single membrane ion channels, single neurons, simple neural circuits and multisystem pathways. Among the neural systems which are the subject of focused research are sensory systems, the limbic system, and the neuroendocrine systems. Attempts are made to correlate electrophysiological results with behavioral, neuroanatomical and/or neurochemical indicators of neurotoxicity. Where possible, methods are used which have direct counterparts in humans, permitting a greater degree of interspecies extrapolation. Studies involving humans are performed as either part of controlled laboratory exposures or upon subjects with accidental exposure to suspected neurotoxicants.

The Food Quality Protection Act of 1996 requires EPA to re-assess the cumulative toxicity of pesticides having a common mechanism of action, considering the potential susceptibility of children and developing individuals. Interactions of pesticides may occur due to alterations in the pharmacokinetics of one pesticide in the presence of a second pesticide. The EPA is currently reassessing the cumulative toxicity of n-methyl carbamate pesticides. This project will examine the tissue levels and pharmacokinetics of carbamate pesticides, to assist with the physiologically-based pharmacokinetic models being developed by NERL.

2 Description of Student Services:

The student contractor shall assist with tissue preparation, pesticide extraction, HPLC analysis, and data reduction and statistical analysis of pesticide levels in animals following exposure to n-methyl carbamate pesticides. This will include preparing extraction solutions, HPLC mobile phase, integrating chromatograms, and entering data into a computer. An understanding of xenobiotic metabolism and analytic chemistry, or electrophysiology and experience working with live animals is desirable. In all cases, the student will need to know basic safety requirements in the laboratory and will be given additional safety requirements at their laboratory.

The student shall maintain careful and accurate records in designated laboratory notebooks. These notebooks and all other data produced in performance of this work will be the property of the US Environmental Protection Agency (EPA).

3. Quality Assurance Requirements:

Activities conducted by the student contractor will be governed by the EPA quality system, as described in the approved NHEERL/NTD Quality Management Plan. The student contractor shall follow all QA requirements for scientific data collection at NHEERL.

4. Description of Working Conditions:

Work will be performed in a laboratory. Students will be required to wear safety apparel and to strictly obey all safety requirements.